1
2   **TO:**
3   EUROPEAN COMMISSION
4   Directorate-General for Migration and Home Affairs
5   B-1049 BRUSSELS
6
7   **Opinions related to the following six (6) co-decision (COD) proposals**
8   **2016/0105 (COD) – COM(2016) 196 final**
9   **2016/0106 (COD) – COM(2016) 194 final**
10   **2016/0357 (COD) – COM(2016) 731 final**
11   **2016/0407 (COD) – COM(2016) 881 final**
12   **2016/0408 (COD) – COM(2016) 882 final**
13   **2016/0409 (COD) – COM(2016) 883 final**
14
15 **Revised opinion based on six (6) co-decision (COD) proposals**
16
17 First of all, a lot of thanks to Directorate-General for Migration and Home Affairs for organising
18 this important consultation.
19
20 This opinion represents an opinion of an individual citizen, not any legal entity.
21
22 This opinion does not contain:
23   –   any business secrets
24   –   any trade secrets
25   –   any confidential information.
26
27 This opinion is public.
28 PDF file of this opinion can be added to a relevant web page
29
30 Annex 1 holds information about previous consultations on the European Union level.
31 Annex 2 holds information about disclaimers and copyright.
32
33
34 Best Regards,
35
36
37 Jukka S. Rannila
38 citizen of Finland
39
40 signed electronically
41
42 [Continues on the next page]

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43
44	**Previous opinion – 2016/0408 (COD) – COM(2016) 882 final**
45
46	Previously I have presented opinion 97.
47
48	 EN: Opinion 97: COM(2016) 882 final - 2016/0408 (COD)
49	 http://www.jukkarannila.fi/lausunnot.html#nro_97
50
51	When publishing that opinion (23 December 2016) I was not aware of other five (5) co-decision
52	(COD) proposals.
53
54	Here we can note that previous opinion (number 97) was rather limited after all.
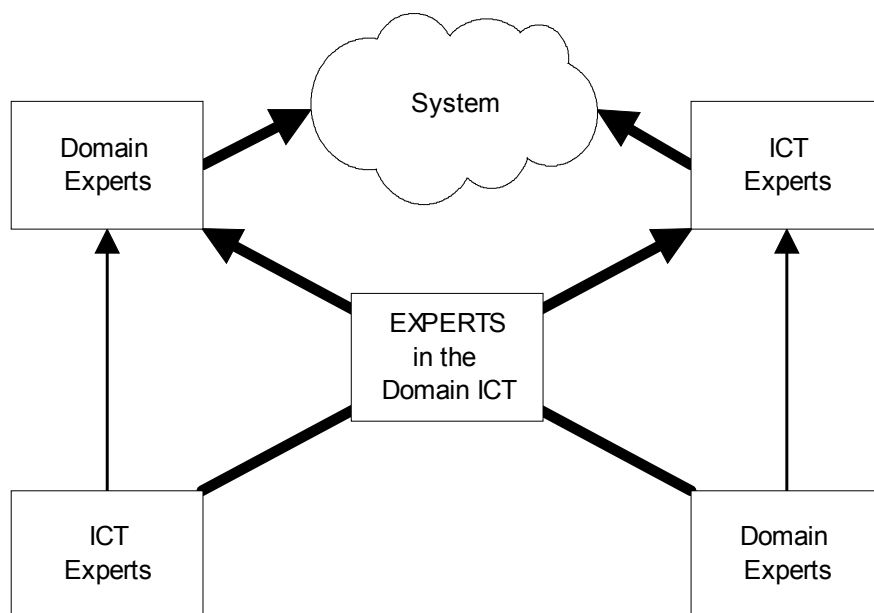55
56	**Amount of background material / Limited opinion**
57
58	Here we can note that there is a lot background material based on different COM documents. I have
59	not read all background material – therefore this opinion is rather limited.
60
61	**Epilogue / Several mismatches between ICT experts and domain experts?**
62

63
64
65	Based on previous opinions (check Annex 1) I have presented the previous figure. Generally
66	speaking different ICT experts try to understand a specific domain. Generally speaking different
67	domain experts try to understand ICT. There can be several mismatches between ICT experts and
68	domain experts.
69
70	Experts in the domain ICT means a lot of education for different stakeholder groups. ICT experts

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71 try to implement system to a certain domain and there is always some learning processes for ICT
72 experts. Domain experts have always some learning processes for understanding possibilities of
73 ICT in a specific domain.
74
75 **Conception for information systems**
76
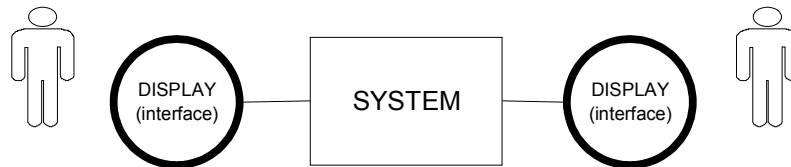
77
78
79 Generally speaking an information system contains displays and/or interfaces which can be used in
80 different ways. There can be several users and/or user groups for an information system
81
82 Here we can note four basic functions for an information system: adding data, retrieving data,
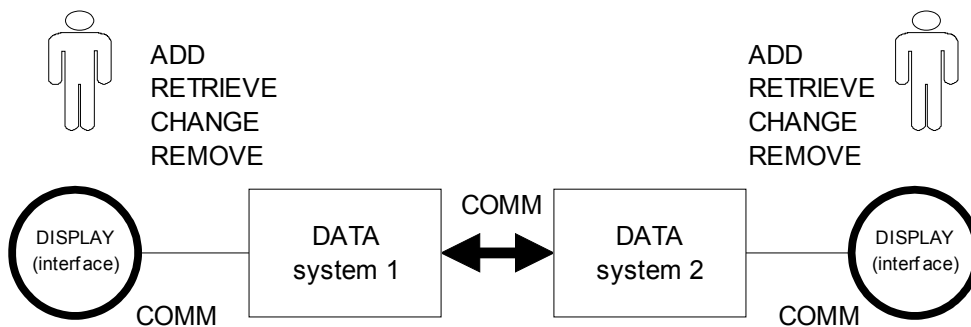83 changing data and removing data.
84
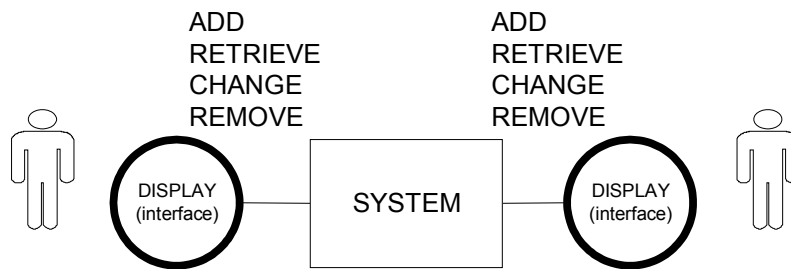
85
86
87 Then we can note that different information systems can have some cooperation based on different
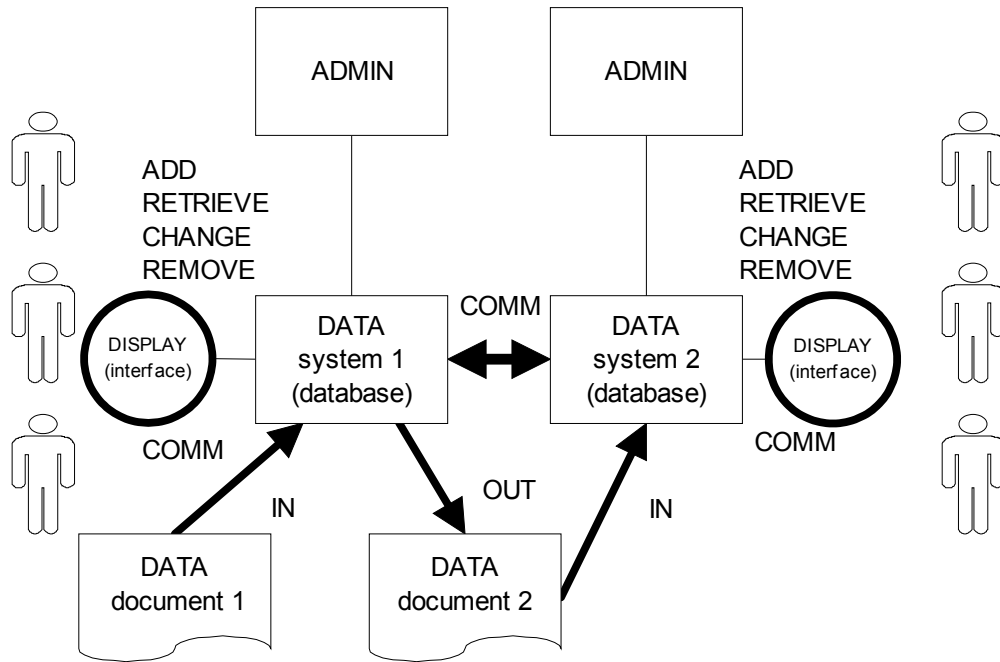88 communication methods (COMM).
89

90
91
92 Cooperation between systems can be direct system-to-system communication (COMM). Then we

93 can note that cooperation between systems can be based on transmitting documents between
94 different information systems. There is also different administrative (ADMIN) duties when different
95 systems are used.
96

97
98
99 **What this means to information systems?**
100 **1)   There can be several users / user groups for an information system.**
101 **2)   There can be several systems which can have direct system-to-system**
102 **   cooperation.**
103 **3)   There can be several systems which can transmit documents between different**
104 **   systems.**
105

106 Like the figure indicates, there are databases in different information systems. Then there are
107 different documents for transmitting data between different systems. Here we can note especially
108 following standardisation needs for different parts of different parts of an information system.
109

110 From this simple (figure) conception we can differentiate several standard classes.
111   1) Data (documents) standards
112   2) Data (database) standards
113   3) Standards for adding data to a system.
114   4) Standards for retrieving data from a system.
115   5) Standards for changing data in a system.
116   6) Standards for removing data from a system.
117   7) Display standards
118   8) Interface standards
119   9) Different communication standards.

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120
121   **Proposal 1: There could different standardisation efforts for communication, data,**
122   **document, database, display/interface standards.**
123
124   **Proposal 2: Different system-to-system connections could be assessed after this**
125   **consultation.**
126
127   **Proposal 3: Need for different documents for transmitting data between systems could**
128   **be assessed after this consultation.**
129
130   **Proposal 4: Assessing previously developed standards could be done seriously.**
131
132   Here we can note that there can be direct system-to-system connections, which can mean some
133   standardised interfaces. Also we can note that different document formats can be used when there is
134   system-to-system connections.
135
136   **Note: There may be a need for both solutions – direct system-to-system**
137   **connections and transmitting different documents between systems.**
138
139   **Proposal 5: Probably there has to both options implemented – direct system-to-system**
140   **connections and transmitting different documents between systems.**
141
142   **Second conception for information systems**
143
144   Generally speaking we have different techniques on the information technology field. Here we can
145   note that programs (most arrows) are in the middle of different information systems. Then programs
146   handle the data in a system (documents and/or databases). However we have to have one specific
147   program which is different – i.e. operating system. Operating systems handle connections with
148   machinery and processors. Generally speaking programs can work with an operating system and
149   developers of programs use different parts of an operating system.
150
151   <u>**What this means to information systems?**</u>
152   **4)   There are different and competing standards on different levels.**
153   **5)   Different standard versions means security problems.**
154   **6)   Different information systems means implementation of several standards.**
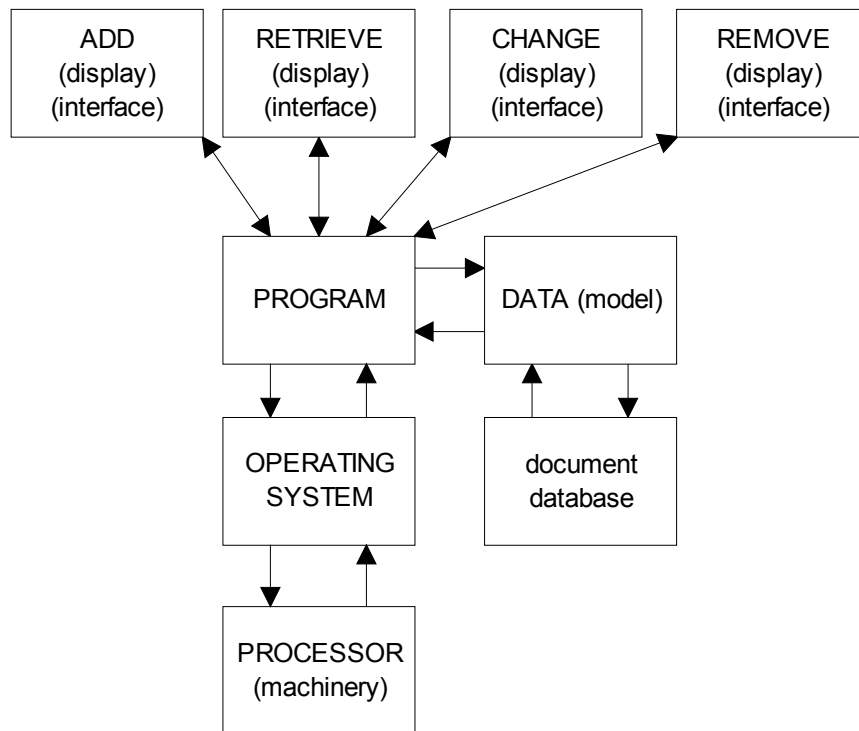155   **7)   There can different mismatches between different standards in an information**
156   **system.**
157
158   [Continues on the next page]

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```
┌──────────────┐  ┌──────────────┐  ┌──────────────┐  ┌──────────────┐
│     ADD      │  │   RETRIEVE   │  │    CHANGE    │  │    REMOVE    │
│  (display)   │  │  (display)   │  │  (display)   │  │  (display)   │
│ (interface)  │  │ (interface)  │  │ (interface)  │  │ (interface)  │
└──────────────┘  └──────────────┘  └──────────────┘  └──────────────┘

          ┌──────────────┐      ┌──────────────┐
          │   PROGRAM    │◄────►│ DATA (model) │
          └──────────────┘      └──────────────┘

          ┌──────────────┐      ┌──────────────┐
          │  OPERATING   │      │   document   │
          │    SYSTEM    │      │   database   │
          └──────────────┘      └──────────────┘

          ┌──────────────┐
          │  PROCESSOR   │
          │  (machinery) │
          └──────────────┘
```

159
160
161   **What this means to information systems**
162   **8)   There can be several computer programs.**
163   **9)   There are several providers of different computer programs.**
164   **10)   There are naturally competing programs.**
165   **11)   Different programs comply with different standards.**
166
167   We have to note that data can have different models and data (models) are developed and/or used
168   bydifferent stakeholders (four basic functions). Especially in databases there are possibilities for
169   several data models; depending on the modellers there can be different data models in databases.
170   Generally speaking changing data models can be very difficult in many cases.
171
172   In the previous consultations I have advocated following solution as the maximum solution:
173
174   * public sector institute owns the machinery and processor of the information system
175   * the machinery and processor are based on relevant open standards
176   * the operating system is based on an open-source solution
177   * public sector institute owns the source code of the information system
178   * public sector institute owns the database of the information system
179   * the database is based on open-source solution and on relevant open standards
180   * public sector institute owns all data in the information system.
181
182   Here we can note the difference between owners, agreements and members. In reality ownerships
183   agreements and memberships cause very complex networks, and those networks are changing all

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184 the time: divisions, mergers, ownership changes, agreement changes, cooperation with other
185 entities, life-cycles, etc.

186
187 Here we can note that ownership, agreement and membership are interlinked in different ways.
188 Generally speaking average usage of a system means an unique combination of ownership,
189 agreement and membership. When everything works fine there are not problems. However changes
190 with ownership, agreement and membership can result difficult situations.

191

	Owner? Member? Agreement?	Standards?	OPEN	CLOSED
1. Device / Machinery				
2. Operating system				
3. Program(s)				
4. Data models / Conceptual models				
5. Documents				
6. Databases				
7. Communications				
8. Retrieve / Interface / Display				
9. Add / Interface / Display				
10. Remove / Interface / Display				
11. Change / Interface / Display				

192
193 Naturally, there can be solutions, which are not based on the maximum solution. It can be
194 concluded, that this consultation is not (yet) about technical details.

195
196 　　　　　　**Note: The relations between different aspects of information systems can result**
197 　　　　　　**rather complicated (legal) network(s): i.e. Ownership, Membership, Agreement.**

198
199 　　　　　　**Proposal 6: There could be some considerations for assessing possible / future changes**
200 　　　　　　**in ownerships, agreements and memberships.**

201
202 Here we can note the difference between owners, agreements and members. In reality ownerships
203 agreements and memberships cause very complex networks, and those networks are changing all
204 the time: divisions, mergers, ownership changes, agreement changes, cooperation with other
205 entities, life-cycles, etc.

206
207

208 **What this means to information systems?**
209 **12)** **There could be clear information of membership, ownership and agreements of**
210   **different information systems.**
211 **13)** **There could be some (new?) regulations for keeping the catalogue of different**
212   **information systems up-to-date.**
213 **14)** **There can be problems with private ownership.**
214 **15)** **Ownership changes have implications for security issues with information**
215   **systems.**
216 **16)** **Complex layers of ownership, membership and agreements mean several**
217   **problems when developing and maintaining different software.**
218
219 Here we can note that ownership, agreement and membership are interlinked in different ways.
220 Generally speaking average usage of a system means an unique combination of ownership,
221 agreement and membership. When everything works fine there are not problems. However changes
222 with ownership, agreement and membership can result difficult situations.
223
224 **What this means to information systems?**
225 **17)** **Complex networks of membership, ownership and agreements can chance**
226   **during life-cycles of different information systems.**
227 **18)** **Assessing complex networks of membership, ownership and agreements could**
228   **be done regularly.**
229
230 **Standards / "standards wars" or "format wars" / Standardisation organisations**
231
232 **Proposal 7: There could different standardisation efforts for communication, data,**
233 **document, database, display/interface standards.**
234
235 **Proposal 8: Assessing previously developed standards could be done seriously.**
236
237 **Proposal 9: Providing (open) data with different timeframes could be assessed**
238 **carefully.**
239
240 **Proposal 10: Providing (open) data directly from database(s) could be assessed**
241 **carefully.**
242
243 **Proposal 11: Providing (open) data as documents could be assessed carefully.**
244
245 There are different standards setting organisations on the information technology field. One list [1] of
246 these standards setting organisations is provided by ConsortiumInfo.org.
247
248 **What this means to information systems?**
249 **19)** **There are several standardisation issues.**
250 **20)** **There is a need for several standards on different levels.**
251 **21)** **There are several standardisation organisations.**

---

1   Standard Setting Organizations and Standards List, www.consortiuminfo.org/links/linksall.php

252   **22)   Assessing and selection of standards mean more work.**
253   **23)   This means constant reviews of different standards.**
254   **24)   It is possible to implement "wrong" standards.**
255   **25)   Part of selected standards can be failures.**
256   **26)   This means constant work for implementing existing and new standards.**
257   **27)   Constant modifications of software can result new security problems.**
258
259   One warning can be said about standards setting organisations. All standards setting organisations
260   are not successes based on several factors and there can may irrelevant standards setting
261   organisations. Market situation on different vehicle markets varies a lot based on different factors.
262
263   Here we can note some problems:
264   * some systems are based on **de-facto** standards
265   * some systems are based on **de-jure** standards
266   * there can be confrontations between **de-facto** and **de-jure** standards
267   * there can be a monopoly situation in some domain
268   * some standards may inhibit possible actions of some stakeholders
269   * there can be a standard war on some domains
270   * standards have different life-cycles
271   * systems have different life-cycles
272   * there can be mismatches between different life-cycles
273   * there can be failed standards
274   * there can be deprecated standards.
275
276   It is quite normal situation in the information technology field that there are competing standards
277   for some application field. Therefore there are all the time ongoing "standards wars" or "format
278   wars". The information technology standards tend to be interrelated and one "standards war" or
279   "format war" can lead to another similar situation.
280
281   **What this means to information systems?**
282   **28)   Different standards should be assessed carefully.**
283   **29)   There could be a catalogue of different standards**
284   **30)   There could be some (new?) regulations for keeping the catalogue of different**
285   **standards up-to-date.**
286
287   I have advocated open standards even though in some cases open standards are not de facto
288   standards. In practice public sector has very important role, when some standards are competing in
289   the market place. Because public sector has a considerable power when buying/developing
290   information systems and therefore public sector can sometimes direct markets to certain standards.
291   Therefore there should be serious vigilance when assessing different standards and "standards" in
292   some application fields.
293
294   **Proposal 12: Current standardisation (e.g. list provided by ConsortiumInfo.org) efforts**
295   **by different organisations could be assessed carefully.**
296

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297   **Proposal 13: Based on the assessment of different standards, there could be reasoned**
298   **decisions to use some standards.**
299
300 There are differences between horizontal and vertical standards. A simple example is naturally
301 email solutions. There are several vertical standards when creating technically email solutions. Then
302 there are horizontal standards which enable sending messages between technically different email
303 solutions.
304
305   **Proposal 14: There could be assessment of vertical and horizontal standards.**
306
307   **Proposal 15: Using horizontal standards could be favoured when creating different**
308   **information systems.**
309
310 Horizontal standards enables technological solutions which can work together. Horizontal standards
311 hides different complexities in information systems.
312
313   **Opinion: The number of redundant standardisation efforts should be minimal.**
314
315   **Proposal 16: There could be separation of horizontal standards and vertical standards.**
316
317   **Proposal 17: There could be different standardisation efforts to horizontal standards**
318   **and vertical standards.**
319
320 Personally I have advocated using different horizontal standards. For example email standards
321 (horizontal) are implemented with very different technologies (vertical).
322

323
324

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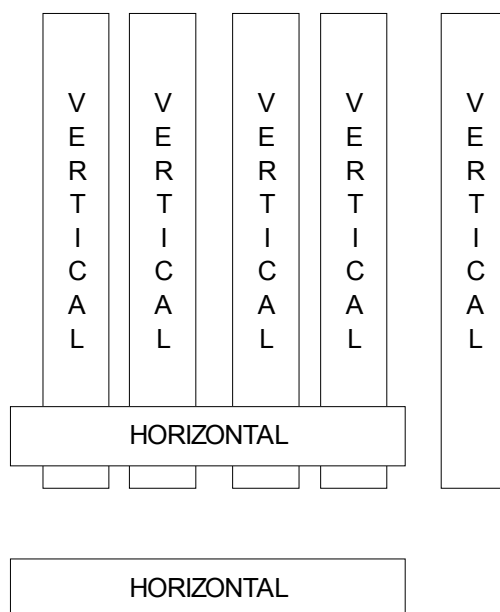
325   **Proposal 18: Government should especially concentrate on open horizontal standards.**
326
327   **Proposal 19: Some government agencies could apply for memberships of different**
328   **standard setting organisations which develop especially open horizontal standards.**
329
330   **Proposal 20: Government agencies should not be passive by-standers when different**
331   **open horizontal standards are developed.**
332
333   **Proposal 21: Government agencies could financially support development of open**
334   **horizontal standards.**
335
336 Here we can note that developing horizontal standards is very demanding compared to developing
337 vertical standards.
338
339   **<u>What this means to information systems?</u>**
340   **31)**   **There can be different standardisation organisations which provide different**
341   **standards.**
342   **32)**   **There can be competing horizontal standards.**
343   **33)**   **Some government agencies could join some standardisation organisations**
344   **which develop especially open horizontal standards**
345   **34)**   **Some government agencies could fund development of open horizontal**
346   **standards.**
347   **35)**   **Sometimes there are no open horizontal standards.**
348   **36)**   **Development of new (open) standards means hired personnel and other**
349   **monetary costs.**
350   **37)**   **Absence of open horizontal standards means several problems.**
351   **38)**   **Horizontal standards based on private solutions mean several problems.**
352
353 Here we can note that developing horizontal standards is very demanding compared to developing
354 vertical standards.
355
356 **More and more new identifiers (ID) / Challenges to privacy?**
357
358 In the previous consultations there has been discussion about different identifiers (ID) in different
359 information systems. It can be noted from the previous opinions that there will be several and
360 different identifiers (ID) for different levels.
361
362 Examples of these identifiers (ID) are following:
363
364   1) Facebook ID for an individual person
365   2) Facebook ID for the individual up-dates of individuals
366   3) Data Universal Numbering System (D-U-N-S)
367   4) Reuters instruments codes (RICs)
368   5) Social security code for individual citizens in the European Union member states
369   6) Business identity code for a company in an European Union member state

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370   7) Value added tax code for a company in an European Union member state.
371
372 The examples of private identifiers (Facebook IDs, Data Universal Numbering System (D-U-N-S),
373 Reuters Instrumens Codes (RICs)) show, that persons and/or communities can use or even demand
374 of using identifiers (ID) from privately owned information systems.
375
376   **Proposal 22: There could be a systematic review of different identifiers (ID) on**
377   **different levels.**
378
379   **Proposal 23: Possible systematic review of different identifiers (ID) should assess**
380   **different situations.**
381
382 Different information systems have also internal identifiers (ID) and external identifiers (ID) for
383 (possible) public usage. The added value for different stakeholders is provided by combination of
384 different identifiers (ID) in a specific information system.
385
386   **Proposal 24: The could be some assessment(s) based on different versions of different**
387   **identifiers (ID).**
388
389 It can be possible, that there are some legacy identifiers (ID) in the near future. It can be possible,
390 that gradually some legacy identifiers (ID) can be consolidated for more standardised identifiers
391 (ID), but this consolidation means some serious technical and administrative actions.
392
393   **Proposal 25: Legacy identifiers (ID) could be assessed seriously.**
394
395 When information about relevant identifiers is collected, there could be a serious assessment of
396 possible (near) monopoly situation of some identifiers. Depending on the nature of an identifier,
397 there may be a need for serious (anti-trust?) negotiations with providers of some identifiers.
398
399   **Proposal 26: The nature of different identifiers (ID) could be assessed.**
400
401   **Proposal 27: There could be serious negotiations with some providers of identifiers**
402   **(ID).**
403
404 In the European Union there has been different anti-trust cases which are related to different private
405 sector identifiers (ID), since some of those private sector identifiers (ID) have been used in several
406 other systems. Some private sector identifiers (ID) can mean a (near) monopoly situation.
407
408   <u>**What this means to information systems?**</u>
409   **39)**   **Number of different identifiers (ID) is increasing – not decreasing**
410   **40)**   **New identifiers (ID) mean a lot work for creating and/or updating of different**
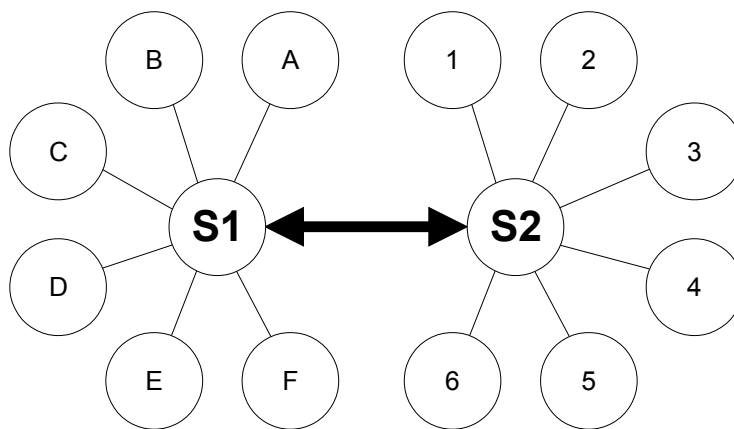411   **information systems.**
412   **41)**   **There can new identifiers (ID).**
413   **42)**   **There can public and private identifiers (ID).**
414   **43)**   **Some private identifiers (ID) can limit actions of different stakeholders.**

415   **44)**   **Different identifiers (ID) related to energy systems could be assessed carefully.**
416   **45)**   **There could be some discussions with communities which provide private**
417   **identifiers (ID).**
418   **46)**   **Monopoly situation with some private identifiers (ID) could be assessed.**
419
420 **Added value of different identifiers (ID)?**
421

1-2

422
423
424 Here we can note possible cooperation between different systems and usually cooperation between
425 different systems means using different identifiers (ID). There can be some central (S1 ↔ S2)
426 systems which collect information from other systems which have own identifiers (ID).
427
428 **The number of different interfaces?**
429
430   **Proposal 28: Based on the results of this consultation there could be some modelling**
431   **work for different interfaces.**
432
433   **Proposal 29: Different stakeholder groups (may) need different interfaces.**
434
435 **Problem with several interfaces?**
436
437 Here we can note people learn usage of an information system with different timeframes ($T_n \leftrightarrow T_n$).
438 In time beginners can become expert users after some experience of using a system. A general
439 mistake is to create just one interface to all stakeholder groups – in many cases interface is
440 developed for beginners.
441
442 [Continues on the next page]

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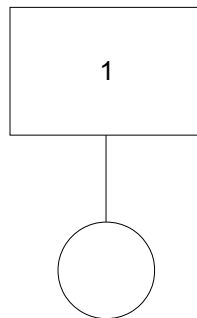
443

444

445 In reality expert users need efficient shortcuts to all functions in an information system. After
446 creating an interface to experts users there can be development of interfaces to other stakeholder
447 groups.

448
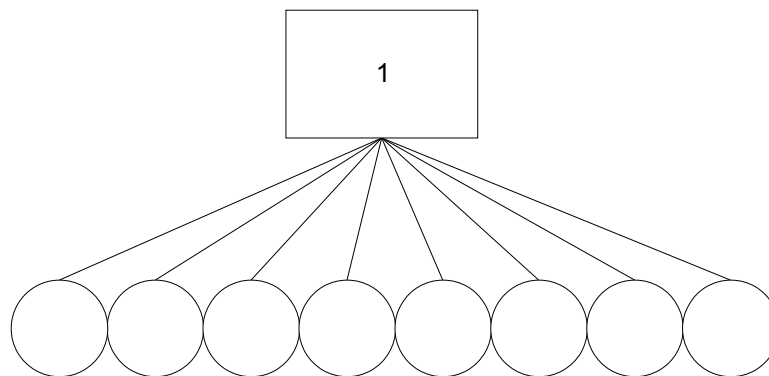
449

450

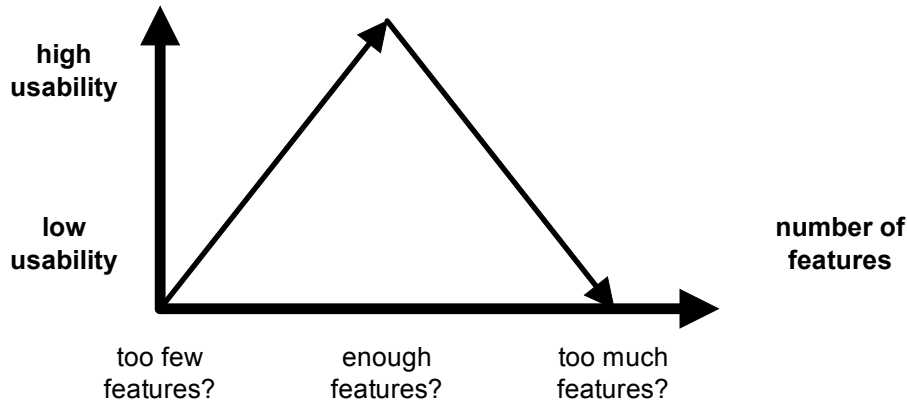451 Here we can note the number of different interfaces for different stakeholder groups.

452

453 **Proposal 30: Number of different interfaces should be assessed carefully.**

454

455 **Proposal 31: Creating different displays and interfaces could be assessed carefully.**

456

457 [Continues on the next page]

458
459
460   It is also possible that there are too many features implemented in an information system; too many
461   features means problems for expert users and average users. Like said before there has to be
462   different interfaces – not just one interface for beginners.
463
464   It is also possible that there are too many features implemented in an information system; too many
465   features means problems for expert users and average users. Like said before there has to be
466   different interfaces – not just one interface for beginners.
467
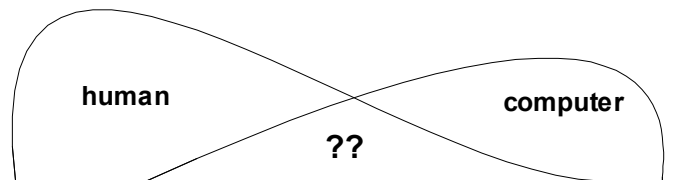
468
469
470   In reality there are several ways for organising task: humans only; computers only; combinations
471   for human and computers. Naturally the last task (combinations for human and computers) is
472   hardest to implement in reality – sometimes we create wrong combinations for these tasks.
473
474   **What this means to information systems?**
475   **47)**   **(New) interfaces and/or displays mean new security problems.**
476   **48)**   **Number of features in interfaces and/or displays can be overwhelming.**
477   **49)**   **Complex interfaces mean new security problems.**
478
479   In previous consultations I have advocated standardisation of interfaces. There are different
480   processes (Beginning → Actions → Ending), which can be described in different levels of details.
481
482   Based on the previously proposed actions there can be a clear understanding of different processes.
483   It can noted that describing different processes can mean a lot of work for different stakeholders.
484

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485 It can be noted here that describing different processes are implement in information systems which
486 are hierarchically structured. So there is always some possible mismatches between actual process
487 models and actual hierarchy of system.
488
489 Here we can note, that in a process some objects change their state in different stages.
490
491   **Proposal 32: After some serious assessment there could be some serious work for**
492   **standardised (SPEX) interfaces and displays.**
493
494   **Proposal 33: Some parts of the processes could be standardised for interfaces (SPEX)**
495   **for different stakeholders.**
496
497   **Proposal 34: Some standardised customer interfaces (SPEX) could be used for having**
498   **better service processes for different stakeholders.**
499
500 It can be noted, that several systems could implement (SPEX) the same parts of different processes,
501 even though the technology in different systems can be totally different.
502
503 Here we can differentiate following issues:
504
505   •   object of a process
506   •   beginning of a process
507   •   ending of a process
508   •   actions of a process
509   •   variety in a situation.
510
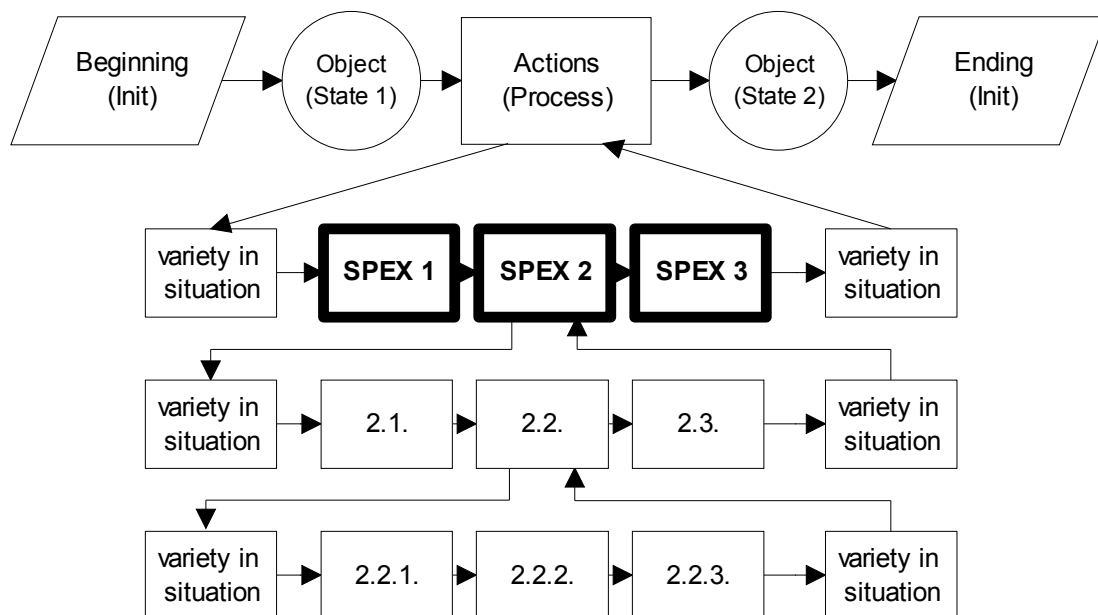
511
512

513 There can be different objects: especially material, information and humans. Material and
514 information is stable but humans are never in a stable state.
515
516 There could be some points in a process model where there is very detailed (**SPEX**) parts. Naturally
517 in these parts (**SPEX**) there could be very detailed information about different concepts.
518
519 Since humans are learning entities there can be different shortcuts in different process models
520 implemented in computerised systems.
521
522 Based on the previously proposed actions there can be a clear understanding of different processes.
523 It can noted that describing different processes can mean a lot of work for different stakeholders.
524
525 It can be noted here that describing different processes are implement in information systems which
526 are hierarchically structured. So there is always some possible mismatches between actual process
527 models and actual hierarchy of system.
528
529   **What this means to information systems?**
530   **50)   Ambiguous specifications (SPEX) for standardising interfaces mean more**
531   **problems.**
532   **51)   Too complex interfaces mean several security problems.**
533
534 **Actually specifying something (SPEX) / Processes**
535
536 Previously I have mentioned concepts and interfaces. It is always possible to model processes for
537 different information systems.
538
539 Here we can note that processes can be modelled on different levels. Then it could be possible to
540 decide which parts of the process (SPEX) are done with computers and what can be more traditional
541 (SPEX) interfaces – e.g. paper-based forms.
542
543   **Proposal 35: Different processes between different stakeholder groups can be modelled.**
544
545   **Proposal 36: After modelling concepts there can be more reasoned decision for**
546   **computer-based interfaces (SPEX) and traditional interfaces (SPEX).**
547
548   **Proposal 37: Different traditional interfaces (SPEX) could be explicated first – e.g.**
549   **paper-bases forms.**
550
551   **Proposal 38: After explicating traditional interfaces (SPEX) there can be some**
552   **modelling work for user interfaces.**
553
554 After modelling traditional user interfaces (e.g. paper-based forms) it could be possible to have all
555 relevant concepts explicated. After explicating different concepts it can be possible to model user
556 interfaces based on different concepts.
557

558   Nowadays we have different tools for describing / modelling different user interfaces. I have
559   browsed web pages of some user interfaces developing tools. One promising tool is [2] Pencil (by
560   Evolus). With that kind tool it could be possible to model different user interfaces.
561
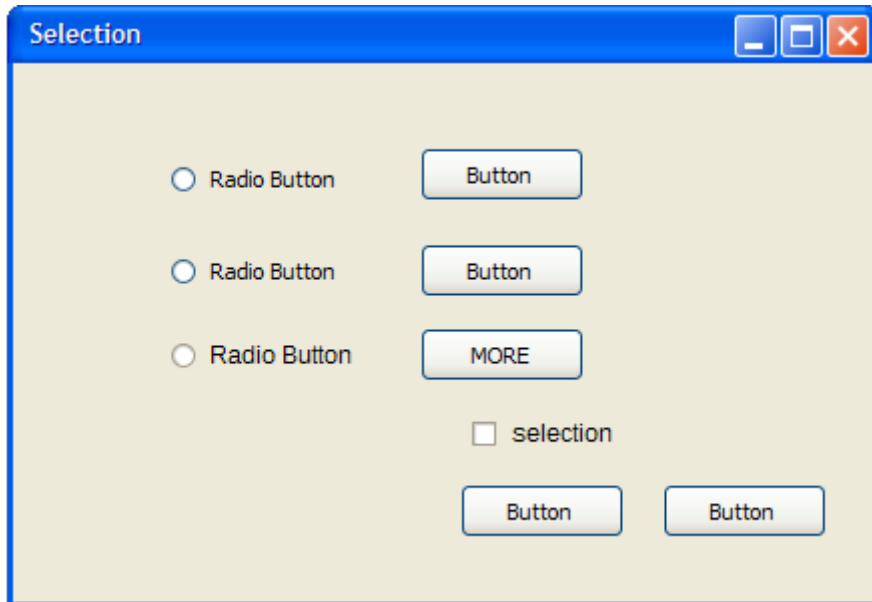
An example of an interface: done with Pencil (by Evolus)

562
563
564
565   I have proposed following order for modelling user interfaces:
566
567   1) Simple and powerful user interfaces for expert users should be modelled first.
568   2) Next user interface could be for daily user.
569   3) Next user interface could be for weekly users.
570   4) Next user interface could be for monthly users.
571   5) Etc. can be developed gradually.
572
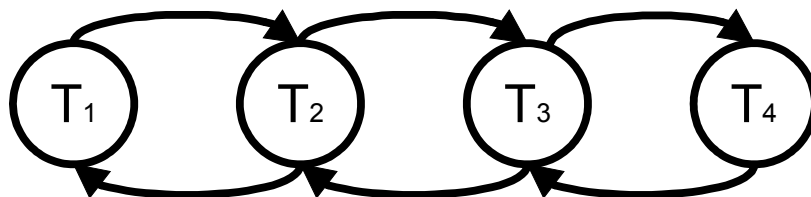
573
574
575   Different expert users need shortcuts to everything and their interfaces can be very simple. People
576   learn and forget ($T_n \leftrightarrow T_n$) different issues when using systems and therefore it should be possible to
577   move between different interfaces. It should be possible to become an expert user (T_1, T_2, T_3, T_4)
578   after some learning processes.
579
580   **Proposal 39: Different user interfaces for expert users could be modelled first.**

2   http://pencil.evolus.vn, open-source GUI prototyping tool (Pencil by Evolus)

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581
582   **Proposal 40: More complex user interfaces could be modelled after modelling user**
583   **interfaces for expert users.**
584
585   Generally speaking we tend to create interfaces which are not valued by expert users. Expert users
586   need shortcuts to everything. It can be also said that users learn different issues gradually and
587   therefore there can different interfaces based on learning processes of different users.
588
589   Depending on time (T_1, T_2, T_3, T_4, T_n) users learn and forget different features ($T_n \leftrightarrow T_n$) of a
590   specific system. Therefore there can be different shortcuts and even different interfaces for different
591   stakeholders. Like said expert users demand very simple and powerful interfaces.
592
593   **Proposal 41: There could be some efforts with some stakeholders to gather ideas for**
594   **different interface proposals.**
595
596   **Proposal 42: There could be a consultation for gathering interface proposals from**
597   **different stakeholders (communities).**
598
599   **Possible reality / Several systems without connections to other systems**
600
601   The current reality (0) is that there can several systems which are not connected to other systems.
602   However in the future there can be several ways for cooperation between systems. The problem in
603   the future may be very complex system-to-system (1) connections.
604
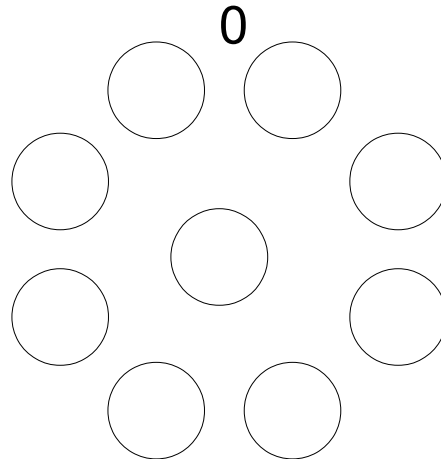
605
606   **Possible reality: Several systems without connections**
607
608   **Possible future: Very complex system-to-system relations and/or several connections**
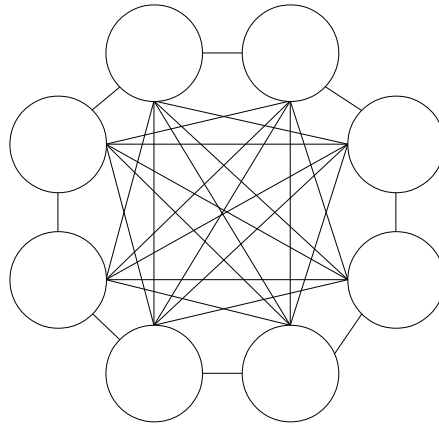609
610   [Continues on the next page]

1

611
612   **Possible future: Very complex system-to-system relations and/or several connections**
613
614   Generally speaking these many-to-many connections can work quite well when there are not
615   changes in different systems. The problem arises when there are changes in one system since one
616   change can affect several other systems.
617
618   Based this problem there are in many cases one central system (2) which can handle cooperation
619   between different (sub)systems. The problem with this option is the failure of the central system and
620   this can lead to unwanted outage of several (sub)systems.
621

2
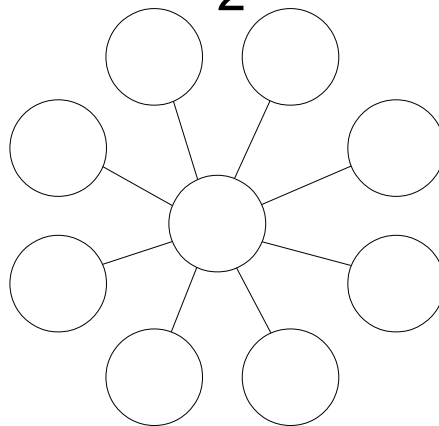
622
623   **One central system**
624
625   One option (3) is to have a hierarchy between different system. In this way there cab some systems
626   which are not connected to the central system. With this approach not all (sub)systems face the
627   same problem with a failure in the central system.
628

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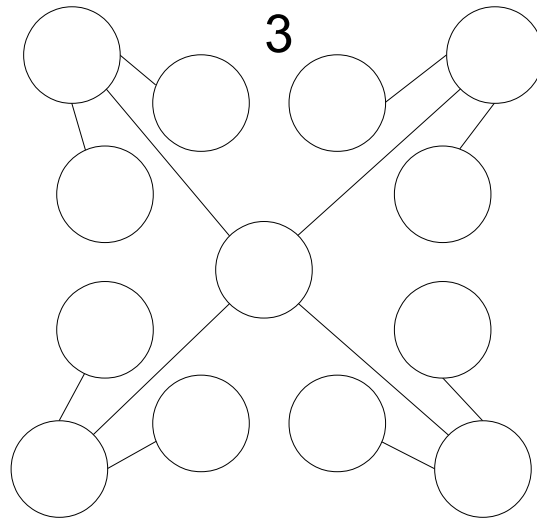
629
630 **Possible future: Some systems are organised into a hierarchical structure**
631
632 **Complex networks of different systems?**
633
634 The reality: There will be several layered systems developed by several stakeholder communities
635 (both for-profit and non-profit communities).
636
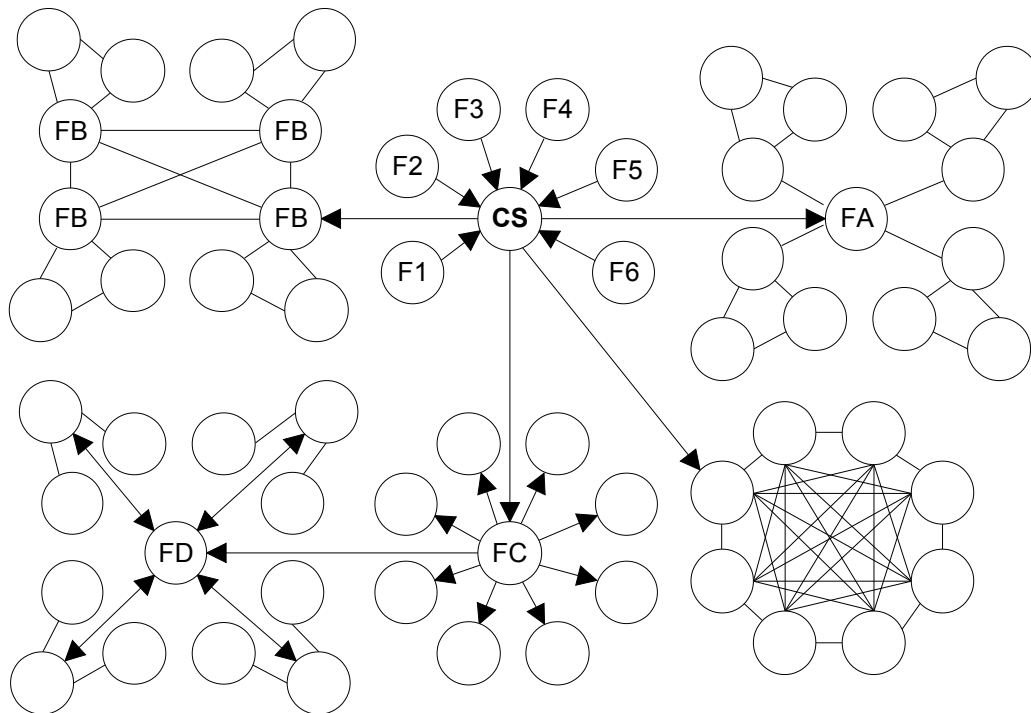
637
638
639 Here we can note that there can some central systems (CS) and information from those central
640 systems can be distributed to several other systems. In reality the added value for users (citizens and

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different legal entities) is achieved by combining different systems to provide different services.

We can note that there can several formats (e.g. 1-6, A-D) for transmitting information from some central (CS) information system. Some formats may be non-standard or standard.

>   **What this means to information systems?**
>   **52)   There could be one central information system which collects information from other systems.**
>   **53)   One central information system could use different standards (e.g. RSS and/or Atom).**
>   **54)   One central information system could provide several web feeds for different stakeholders.**

One issue for central information system could be security issues. Security notifications should be transmitted very fast for different stakeholders.

>   **What this means to the Digital Strategy for Scotland – 2017 and beyond?**
>   **55)   There could be some regulations about security notifications.**
>   **56)   There could be one central information system which collects security notifications.**
>   **57)   One central information system could forward security notifications to other information systems.**

In reality the added value for different stakeholders is cooperation between different systems. In reality this consolidation of different systems mean a lot of work with different stakeholders.

>   **Proposal 43: Complex networks of different systems could be assessed.**

>   **Proposal 44: Need for different central systems could be assessed.**

More technical consultations?

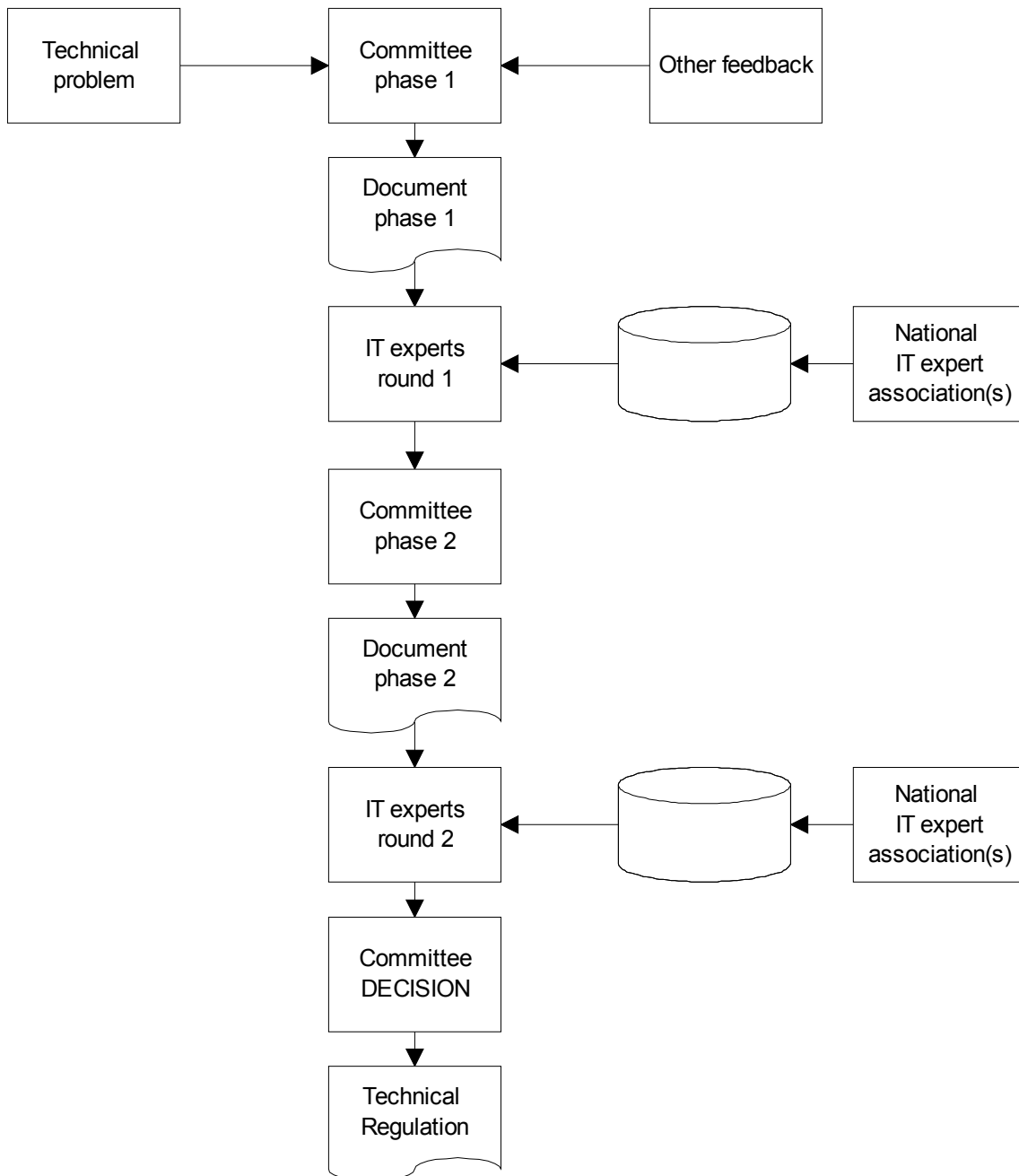Based on answers (this consultation) there could be more technically oriented consultations. Previously mentioned issues (this opinion) could be detailed for new technically oriented consultations.

>   **Proposal 45: More technically oriented consultations could be organised after this consultation.**

[Continues on the next page]

682
683
684   Based on previous opinions a process model for technical consultations can be presented. It could
685   be possible to inform members of different (national) information technology experts associations
686   about different technical consultations. There can different technical problems when developing
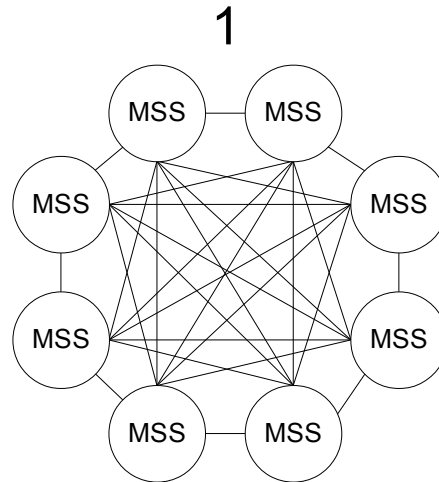687   different information systems.
688
689   **Proposal 46: Members of different (national) information technology experts**
690   **associations could be informed about different consultations based on different**

691   **technical problems when developing different public sector information systems.**
692
693   **Complexity on the European Union level**
694

1

MSS — MSS

MSS   MSS

MSS   MSS

MSS — MSS

695
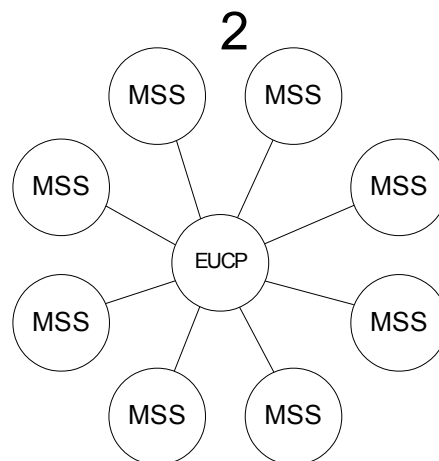696   **MSS = Member State System**
697

698   There are 28 member states (European Union) at the moment. In reality there are unique situations
699   with information systems in different member states. In some cases information systems can be
700   implemented based on complex system-to-system connections. Complex system-to-system
701   connections means a lot of work when there are changes in some systems.
702
703   **Proposal 47: Complex system-to-system connections implemented in information**
704   **systems could be assessed carefully.**
705

2

MSS   MSS

MSS   MSS

EUCP

MSS   MSS

MSS   MSS

706
707   **MSS = Member State System**
708   **EUCP = European Contact Point**
709

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710 One option is to have a single European contact point for member state systems. Here we can
711 calculate connections based on number of information systems.
712
713   1 x 28 member state systems = 28 systems
714   5 x 28 member state systems = 140 systems
715   10 x 28 member state systems = 280 systems
716   15 x 28 member state systems = 420 systems
717   20 x 28 member state systems = 560 systems.
718   28 x 30 member state systems = 840 systems
719
720 Here we can note that there can be hierarchy between different system (EU ↔ member states) and
721 there can be member state contact points (MCP). Then there can be some hierarchy between
722 different systems. (EU ↔ EUCP ↔ MSCP ↔ MSS). There are unique situations with member
723 statesystems in member states. Therefore member state contact points (MCP) can reduce the
724 complexity with European Union contact point (EUCP).
725

3
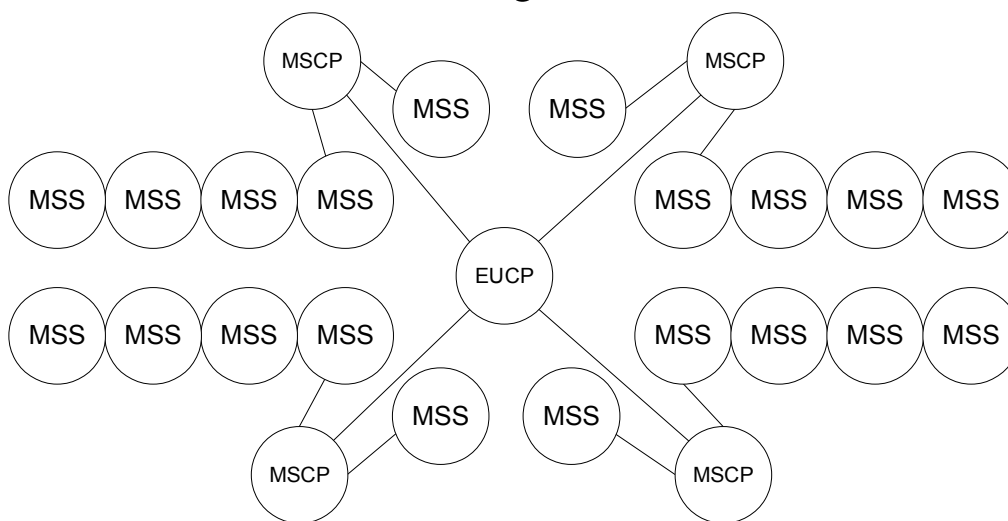
726
727   **MSS = Member State System, MSCP = Member State Contact Point,**
728   **EUCP = European Contact Point**
729
730 Based on those calculations there could be a lot of direct connections to the European contact point.
731 Number of those connections can be overwhelming. The situation between member states can vary
732 in many ways. So there can different and unique systems between member states.
733
734 I have proposed several times creation of member state contact points which could handle different
735 system-to-system connections on member state level. Then it can be easier to create connections
736 between member state contact points and European contact point.
737
738   **Proposal 48: There could be one information system (member state contact point) on**

739   **member state level.**
740
741   **Proposal 49: Different member state systems could be consolidated based on limited**
742   **number system-to-system connections.**
743
744   **Proposal 50: One information system (member state contact point) on member state**
745   **level could handle system-to-system connections on the European Union level**
746   **(European contact point).**
747
748 **An example for cooperation: Web feeds (RSS and Atom)**
749

750
751
752 I have advocated usage of web feeds on several previous opinion documents. Actually there are two
753 standards for web feeds: RSS [3] [4] and Atom [5] [6] [7].
754
755   **Proposal 51: Web feeds could be advocated when developing different informations**
756   **systems.**
757
758   **Proposal 52: Web feeds (RSS and/or Atom) should be used extensively for providing**
759   **(real-time) information for different stakeholder(s) (communities).**
760
761   **Proposal 53: There can be different web feeds (RSS and/or Atom) for different**
762   **stakeholder(s) – having just one web feed (RSS and/or Atom) may not be a feasible**
763   **solution.**
764
765   **Proposal 54: Several web feeds (RSS and/or Atom) can be based on different**
766   **viewpoints.**
767
768 It can be easier to create web feeds in different information systems since web feeds enable
769 connections without direct system-to-system connections.
770
771 It can be noted, that different back-office systems (with a wide variety of different technologies) can
772 implement RSS standards, and these RSS feeds can be used in the front-office systems. With this
773 kind solutions front-office systems don´t need direct system-to-system communications with back-
774 office systems.
775
776 **Mismatches between general knowledge and special knowledge**

3   http://www.rssboard.org/rss-specification, RSS 2.0 Specification
4   https://en.wikipedia.org/wiki/RSS, Wikipedia / RSS
5   https://en.wikipedia.org/wiki/Atom_(standard), Wikipedia / Atom (standard)
6   https://tools.ietf.org/html/rfc4287, The Atom Syndication Format
7   https://tools.ietf.org/html/rfc5023, The Atom Publishing Protocol

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777

GENERAL KNOWLEDGE

?
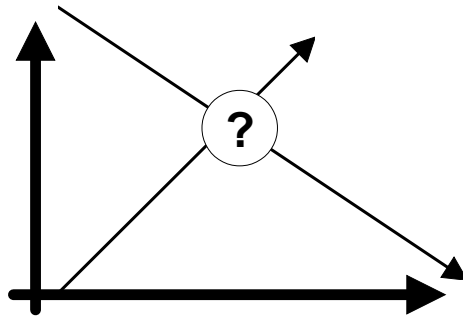
SPECIAL KNOWLEDGE

778
779
780   Here we can note that there can be many mismatches between general knowledge and special
781   knowledge. Generally speaking IT (information technology) skills are rather generic skills which
782   can be applied to different domains. On the other hand persons on different domains master some
783   special knowledge.

784

785   Based on mismatches between general knowledge and special knowledge there has to be serious
786   education for IT personnel (general) and persons on the application domain (special). This serious
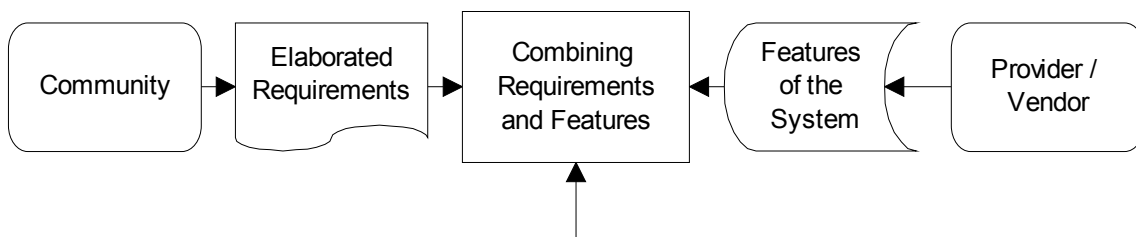787   education should happen before starting new projects.

788
789   **Proposal 55: There could be some serious education about IT skills and domain skills**
790   **for different stakeholders before starting new IT projects.**

791

792   **Understanding requirements and features?**

793

| Community | → | Elaborated Requirements | → | Combining Requirements and Features | ← | Features of the System | ← | Provider / Vendor |

- Humans Alone ?
- Computer Alone ?
- Humans and Computers Together?

794
795
796   **Proposal 56: After serious education about IT skills and domain skills for different**
797   **stakeholders different stakeholders could model requirements well enough.**

798

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799   **Proposal 57: The community procuring some information system(s) should have the**
800   **leading role when modelling different requirements.**
801
802 **Modelling processes?**
803
804 Process modelling is one option. An example for process modelling is naturally usage of flowcharts.
805
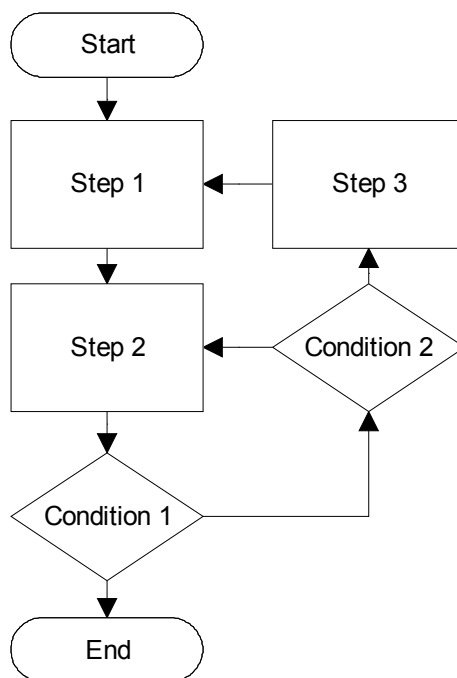
806
807
808   **Proposal 58: The community procuring some information system(s) should have the**
809   **leading role when modelling different processes.**
810
811 **Explaining requirements and processes on different levels?**
812
813 Here we can note that there can be layers (hierarchy) in different human-based systems.
814 Understanding lower layers mean different explanations for upper levels.
815
816   **Proposal 59: The community procuring some information system(s) should model**
817   **processes and requirements also on lower layers (hierarchy).**
818
819   **Proposal 60: There has to be some education about modelling for persons on lower**
820   **layers (hierarchy).**
821
822 Without modelling requirements (etc.) on the lower levels (hierarchy) there will be several
823 problems for different IT projects.
824

EXPLANATORY

more explanations

NOT EXPLANATORY
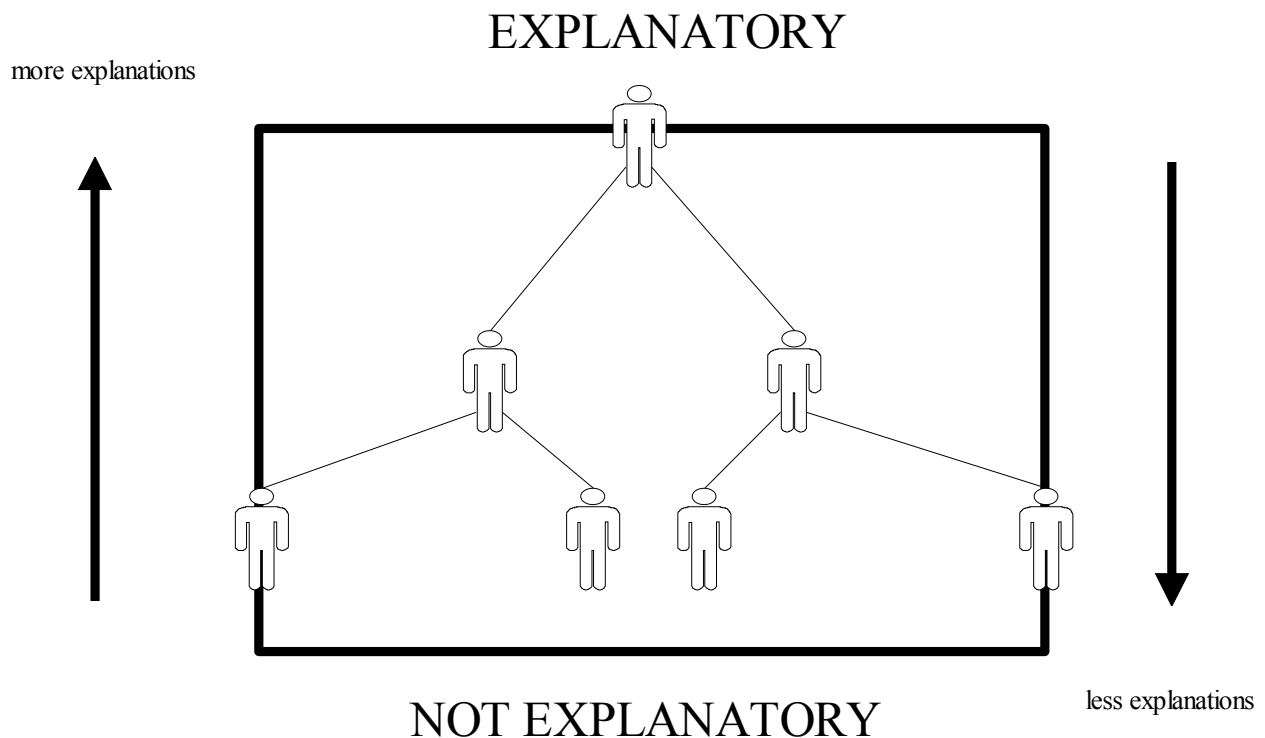
less explanations

825
826
827   We can note that different IT experts are in many cases outsiders who have less knowledge about
828   some application domain(s). Therefore different IT experts are asking different questions and
829   explanations. Without some serious education there will be several mismatches between different
830   stakeholder groups.
831
832
833   **Good luck!!!**
834
835   This opinion is quite limited. Hopefully there are other constructive ideas presented in other
836   opinions. This remains to be seen.
837
838   [Continues on the next page]

839
840
841
842   **ANNEX 1**
843
844
845 My opinions to the previous and relevant consultations – there consultations were mostly organised
846 by the Commission of the Europan Union. General page to all consultations – both in English and
847 in Finnish: http://www.jukkarannila.fi/lausunnot.html
848
849
850 EN: Opinion 1: Review of the rules on access to documents
851 http://www.jukkarannila.fi/lausunnot.html#nro_1
852
853 EN: Opinion 2: Schools for the 21st Century
854 http://www.jukkarannila.fi/lausunnot.html#nro_2
855
856 EN: Opinion 3: The future of pharmaceuticals for Human use in Europe- making Europe a Hub for
857 Safe and Innovative medicines
858 http://www.jukkarannila.fi/lausunnot.html#nro_3
859
860 EN: Opinion 5: Consumer Scoreboard, Questionnaire for stakeholders
861 http://www.jukkarannila.fi/lausunnot.html#nro_5
862
863 EN: Opinion 6: Consultation on a Code of Conduct for Interest Representatives
864 http://www.jukkarannila.fi/lausunnot.html#nro_6
865
866 EN: Opinion 8: European Interoperability Framework, version 2, draft
867 http://www.jukkarannila.fi/lausunnot.html#nro_8
868
869 EN: Opinion 9: CAMSS: Common Assessment Method for Standards and Specifications, CAMSS
870 proposal for comments
871 http://www.jukkarannila.fi/lausunnot.html#nro_9
872
873 EN: Opinion 15: Collective Redress
874 http://www.jukkarannila.fi/lausunnot.html#nro_15
875
876 EN: Opinion 17: Opinion to Antitrust Case No. COMP/C-3/39.530
877 http://www.jukkarannila.fi/lausunnot.html#nro_17
878
879 EN: Opinion 18: Opinion Related to the Public Undertaking by Microsoft
880 http://www.jukkarannila.fi/lausunnot.html#nro_18
881
882 EN: Opinion 19: Official Acknowledgement by the Commission
883 http://www.jukkarannila.fi/lausunnot.html#nro_19

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884 EN: Opinion 20: SECOND Opinion Related to the Public Undertaking by Microsoft
885 http://www.jukkarannila.fi/lausunnot.html#nro_20
886
887 EN: Opinion 21: Opinion about the European Interoperability Strategy proposal
888 http://www.jukkarannila.fi/lausunnot.html#nro_21
889
890 EN: Opinion 23: Public consultation on the review of the European Standardisation System
891 http://www.jukkarannila.fi/lausunnot.html#nro_23
892
893 EN: Opinion 27: Public Consultation on the Modernisation of EU Public Procurement Policy
894 http://www.jukkarannila.fi/lausunnot.html#nro_27
895
896 EN: Opinion 28: Consultation on the Europe 2020 Project Bond Initiative
897 http://www.jukkarannila.fi/lausunnot.html#nro_28
898
899 EN: Opinion 30: Internet Filtering
900 http://www.jukkarannila.fi/lausunnot.html#nro_30
901 NOTE: Organised by the European Committee for Standardization (CEN) [8]
902
903 EN: Opinion 32: COMP/C-3/39.692/IBM – Maintenance services
904 http://www.jukkarannila.fi/lausunnot.html#nro_32
905
906 EN: Opinion 34: REMIT Registration Format
907 http://www.jukkarannila.fi/lausunnot.html#nro_34
908 NOTE: Organised by The Agency for the Cooperation of Energy Regulators (ACER) [9]
909
910 EN: Opinion 35: Exploiting the employment potential of the personal and household services
911 http://www.jukkarannila.fi/lausunnot.html#nro_35
912
913 EN: Opinion 37: CASE COMP/39.654 - Reuters instrument codes
914 http://www.jukkarannila.fi/lausunnot.html#nro_37
915
916 EN: Opinion 39: Registry options to facilitate linking of emissions trading systems
917 http://www.jukkarannila.fi/lausunnot.html#nro_39
918
919 EN: Opinion 40: Media Freedom and Pluralism / audiovisual regulatory bodies
920 http://www.jukkarannila.fi/lausunnot.html#nro_40
921
922 EN: Opinion 41: AT.39398: observations on the proposed commitments
923 http://www.jukkarannila.fi/lausunnot.html#nro_41
924
925 EN: Opinion 42: Opening up Education
926 http://www.jukkarannila.fi/lausunnot.html#nro_42

8   http://www.cen.eu/ (Accessed 2 July 2012)
9   http://www.acer.europa.eu/ (Accessed 2 July 2012)

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927
928   EN: Opinion 43: Publication of extracts of the European register of market participants
929   http://www.jukkarannila.fi/lausunnot.html#nro_43
930   NOTE: Organised by The Agency for the Cooperation of Energy Regulators (ACER)
931
932   EN: Opinion 44: Evaluation policy guidelines
933   http://www.jukkarannila.fi/lausunnot.html#nro_44
934
935   EN: Opinion 45: About ICT standardisation
936   http://www.jukkarannila.fi/lausunnot.html#nro_45
937
938   EN: Opinion 46: Review of the EU copyright rules
939   http://www.jukkarannila.fi/lausunnot.html#nro_46
940
941   EN: Opinion 51: European Area of Skills and Qualifications
942   http://www.jukkarannila.fi/lausunnot.html#nro_51
943
944   EN: Opinion 52: Trusted Cloud Europe Survey
945   http://www.jukkarannila.fi/lausunnot.html#nro_52
946
947   EN: Opinion 53: Trade Reporting User Manual (TRUM) (Draft)
948   http://www.jukkarannila.fi/lausunnot.html#nro_53
949   NOTE: Organised by The Agency for the Cooperation of Energy Regulators (ACER)
950
951   EN: Opinion 55: European Energy Regulation
952   http://www.jukkarannila.fi/lausunnot.html#nro_55
953   NOTE: Organised by The Agency for the Cooperation of Energy Regulators (ACER)
954
955   EN: Opinion 59: Green paper on mobile Health
956   http://www.jukkarannila.fi/lausunnot.html#nro_59
957
958   EN: Opinion 60: Cross-border inheritance tax problems within the EU
959   http://www.jukkarannila.fi/lausunnot.html#nro_60
960
961   EN: Opinion 61: European Register of Products Containing Nanomaterials
962   http://www.jukkarannila.fi/lausunnot.html#nro_61
963
964   EN: Opinion 64: Corporate Social Responsibility - European Commission
965   http://www.jukkarannila.fi/lausunnot.html#nro_64
966
967   EN: Opinion 66: Net Innovation for the Work Programme 2016-2017
968   http://www.jukkarannila.fi/lausunnot.html#nro_66
969
970   [Continues on the next page]
971

972   EN: Opinion 68: European Network Code Stakeholder Committees
973   http://www.jukkarannila.fi/lausunnot.html#nro_68
974   NOTE: Organised by The Agency for the Cooperation of Energy Regulators (ACER)
975
976   EN: Opinion 71: Common Schema for the Disclosure of Inside Information
977   http://www.jukkarannila.fi/lausunnot.html#nro_71
978   NOTE: Organised by The Agency for the Cooperation of Energy Regulators (ACER)
979
980   EN: Opinion 74: Enabling the Internet of Things
981   http://www.jukkarannila.fi/lausunnot.html#nro_74
982   NOTE: Organised by Body of European Regulators for Electronic Communications (BEREC)
983
984   EN: Opinion 80: Mandatory Transparency Register
985   http://www.jukkarannila.fi/lausunnot.html#nro_80
986
987   EN: Opinion 84: Revision of the European Interoperability Framework
988   http://www.jukkarannila.fi/lausunnot.html#nro_84
989
990   EN: Opinion 86: 2016 Annual Colloquium on fundamental rights
991   http://www.jukkarannila.fi/lausunnot.html#nro_86
992
993   EN: Opinion 88: Evaluation and Review of the ePrivacy Directive
994   http://www.jukkarannila.fi/lausunnot.html#nro_88
995
996   EN: Opinion 89: BEREC Guidelines for net neutrality rules
997   http://www.jukkarannila.fi/lausunnot.html#nro_89
998   NOTE: Organised by Body of European Regulators for Electronic Communications (BEREC)
999
1000   EN: Opinion 93: Safety of apps and other non-embedded software
1001   http://www.jukkarannila.fi/lausunnot.html#nro_93
1002
1003   EN: Opinion 95: Targeted consultation on eForms
1004   http://www.jukkarannila.fi/lausunnot.html#nro_95
1005
1006   EN: Opinion 97: COM(2016) 882 final - 2016/0408 (COD)
1007   http://www.jukkarannila.fi/lausunnot.html#nro_97
1008
1009
1010   My opinions to the previous and relevant consultations – there consultations were mostly organised
1011   by the Commission of the Europan Union. General page to all consultations – both in English and
1012   in Finnish: http://www.jukkarannila.fi/lausunnot.html
1013
1014   [Continues on the next page]

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10 Based on the Finnish three-party system there is a phenomenon called extreme-centre in Finland. The 2011
     parliamentary elections in Finland challenged the three-party system, since three "old" parties were not traditionally
     as the three largest parties. On 2015 this "new" party is part of the current Finnish Government. We all must be
     interested about this new development in Finland.

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